Drill and Fill Technique for the Treatment of Scaphoid Delayed Unions and Nonunions

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J Wrist Surg 2020;9:116–123.

Abstract

Background   This article reviews the results of a surgical technique using three iterations of *drilling*, autologous cancellous bone grafting (*filling*), and use of an intraosseous compression screw for the treatment of nondisplaced or minimally displaced scaphoid delayed unions or nonunions.

Methods   Part 1—Cadaveric study: Three cadaveric scaphoids underwent stained cancellous bone graft packing and headless cannulated compression screw placement using a single iteration of drilling and graft packing. Three additional scaphoids were allocated to the triple "drill and fill" group, and underwent three iterations of drilling and graft packing before screw insertion. Graft particle distribution on mid-sagittal sections was assessed under fluorescence microscopy. Comparison of normalized areas between the single and triple "drill and fill" groups was performed using repeated measures ANOVA and Tukey's post hoc test.

Part 2—Clinical study: Twelve patients with minimally displaced scaphoid delayed unions and nonunions treated between April 2007 and December 2013 with the triple "drill and fill" technique were included. The average follow-up was 60.4 weeks. Two fellowship-trained musculoskeletal radiologists independently reviewed images for fracture healing.

Results   By the histomorphometric analysis, there was improved autograft distribution along the screw tract, particularly within the proximal pole, with three iterations of drilling and filling. Clinically, 11 of 12 delayed unions and nonunions had healed.

Conclusion   Our results support the use of the "drill and fill" technique as an option for the treatment of select nondisplaced or minimally displaced scaphoid nonunions and delayed unions at the waist without avascular necrosis of the proximal pole.

Level of Evidence   This is a Level IV study.

Keywords
► autograft
► delayed union
► scaphoid nonunion
► scaphoid
► scaphoid fracture

Scaphoid fractures account for nearly 69% of all carpal injuries and 2.9% of all fractures.[1] The tenuous vascularity across the scaphoid has direct implications on healing, and there is general consensus that proximal pole and displaced waist fractures do better with operative management.[2–6]

Nonunion occurs in up to 12% of the patients if an occult scaphoid fracture is not detected and treated.[7] Imaging at delayed presentation typically shows bone resorption, subchondral sclerosis, or delayed union/nonunion. Whether the result of failed conservative management or missed occult injury, scaphoid delayed unions and nonunions are generally an indication for surgery. The fracture morphology, location, presence of humpback deformity, and presence of avascular necrosis (AVN) dictate the surgical approach, choice of implant, and type and location of donor bone graft (vascularized vs. nonvascularized; cancellous vs. corticancellous; distal radial, iliac crest, or distal femoral).[2,8] Slade et al initially proposed a percutaneous arthroscopically-assisted dorsal technique with a headless cannulated compression screw without grafting for delayed unions.[9] Subsequent studies have further elucidated the technical nuances of similar percutaneous and mini-open techniques for non-displaced scaphoid nonunions.[10–13]

In general, these techniques are indicated for scaphoid nonunions without significant cystic bone resorption, collapse, or proximal pole AVN.[10] Merrell and Slade further described a technique wherein a bone biopsy needle is used to pack cancellous autograft harvested from the distal radius into the nonunion site and screw tract followed by a second drilling prior to screw insertion.[11] Yassaee and Yang reported good results in nine patients with nondisplaced scaphoid nonunions using a similar method.[13] Both studies mention prevention of cortical breech during screw placement as motivation for repeated drilling.

Questions/Purpose

Building off this previous work, we present a similar method with a modification that incorporates three iterations of drilling and graft packing prior to final screw insertion. Currently, there is no literature on the effect of repeated drilling and bone graft packing on autograft distribution within the scaphoid. We aim to answer the following questions regarding this "drill and fill" method:

- Does repeated drilling and graft packing prior to final screw insertion improve graft particle distribution along the screw tract in the scaphoid bone?
- Is repeated drilling and graft packing a safe technique that leads to radiographic healing of scaphoid delayed unions and nonunions?

Methods

Cadaveric Study

Six fresh frozen cadaveric intact scaphoids were obtained, in addition to cancellous distal radius bone graft. Bone graft staining for distribution analysis was accomplished by immersion of the cancellous bone in an aqueous 2 mg/mL

Alizarin Red S solution for 10 minutes, followed by a saline wash. The scaphoids were stabilized using a bench top vise. Three scaphoids were allocated to the "single packing" group, and underwent single drilling (using an Acutrak 2, (Acumed, Hillsboro, OR) 2.5-mm long tip drill from a proximal to distal direction, followed by packing of the stained cancellous graft into the screw tract using a 15-gauge (1.6 mm × 38.1 mm) blunt needle (Monoject) (Covidien/ Medtronic, Minneapolis, MN), followed by a second drilling with the 2.5-mm long tip drill, followed by drilling with a 3.4-mm tail profile drill and placement of a mini-Acutrak screw (Acumed, Hillsboro, OR). The remaining three specimens were allocated to the "triple packing" group, and underwent initial drilling, followed by three iterations of cancellous graft packing into the screw tract and redrilling before final screw insertion. While the exact amount of the packed bone graft was not directly measured, each packing was continued until no further bone graft could be manually packed into the channel by the blunt needle.

All specimens with screws and graft in situ were then fixed in 10% neutral buffered formalin for 1 week, followed by processing through graded ethanol and embedding in methyl methacrylate. A 100 to 150 μm-thick mid-sagittal section was cut from each specimen using an Exakt diamond blade band saw and grinder. These sections were then marked into three subsections for all subsequent analyses: distal pole, waist, and proximal pole. The distribution of the stained autograft particles was assessed under fluorescence microscopy at 10x magnification using OsteoMeasure histomorphometric software (Osteometrics, Atlanta, GA). The total area, autograft area, and area available for autograft were calculated for each subsection (►Fig. 1). The total area (TA) was defined as the total medullary area contained within the cortical borders of the subsection. The autograft area (Ag.A) was defined as the total cumulative area of all the autograft particles within the subsection. The area available for autograft (AA.Ag) was defined as the area between the screw and intact cancellous bone created by the drill tract. Normalized values including autograft area/TA, and area available for autograft/total area (AA.Ag/TA) were calculated for each subsection.
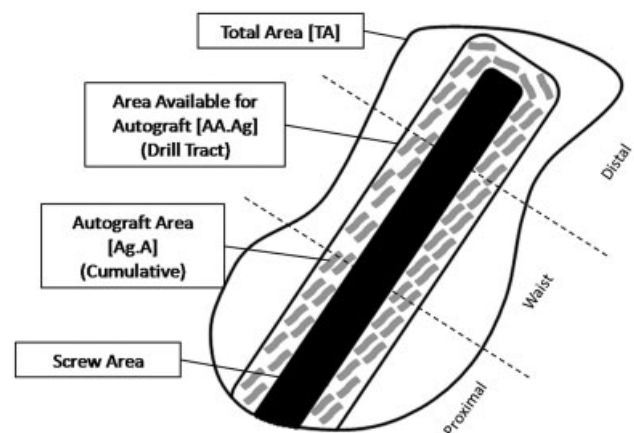

Fig. 1 Schematic representation of scaphoid sagittal areas used for graft distribution analysis.

Statistical analysis comparing values between the single-packing and triple-packing groups within the same subsection of the scaphoid was performed using Student's *t*-test. Comparisons among the subsections, but within either the single-packing or triple-packing groups were performed using repeated measures analysis of variance (ANOVA) and Tukey's post hoc test.

Clinical Study

A total of 12 patients from April 1, 2007 to December 30, 2013—comprised of one grade I, one grade IIIa, nine grade IV, and one grade IVa nonunions—underwent dorsal fixation using the triple "drill and fill" technique and satisfied inclusion criteria for the clinical portion of this study. Fractures that did not demonstrate evidence of healing by 3 months postinjury were considered delayed scaphoid unions and those beyond 6 months as nonunions.[14] Slade and Dodds'[15] scaphoid nonunion classification system was used to classify scaphoid nonunions. This system helps to guide decision making by focusing on the width of the devitalized scaphoid zone and accounts for several factors known to affect healing potential, including presence of AVN, deformity, and instability. The system includes grade I (fractures with delayed presentation of 4–8 weeks), grade II (fibrous nonunions with an intact cartilaginous envelope and no cyst formation or sclerosis), grade III (bone resorption less than 1 mm at the nonunion interface with minimal sclerosis), grade IV (bone resorption between 1 and 5 mm, cyst formation, and maintained scaphoid alignment), grade V (bone resorption between 5 and 10 mm, cyst formation, and maintained scaphoid alignment), and grade VI (gross fragment motion and deformity consistent with pseudarthrosis).[15] Broadly speaking, this classification scheme divides scaphoid nonunions into two groups: early nonunions without substantial bone resorption (grades I–III), and older nonunions with substantial bone resorption (grades IV–VI).

Preoperative and 3 to 6-month postoperative radiographs that included adequate anterior/posterior and lateral views of the scaphoid were required. A preoperative computed tomography (CT) scan was also available for some patients, but was not required for inclusion in the study. Exclusion criteria included those under the age of 18 at the time of surgery, those whose radiographs were not available for review, and revision surgery. Institutional Review Board (IRB) approval was obtained for the study procedures.

Demographic data obtained included age, handedness, sex, gender, smoking status, mechanism of injury, time from injury to fixation, time to initial follow-up, and time to final follow-up. Two fellowship-trained musculoskeletal radiologists independently reviewed all available postoperative radiographs. Radiographs were assessed for fracture healing, displacement, and screw loosening. Each image was re-reviewed by both radiologists, at least 2 weeks after their initial readings to determine intra- and interobserver variations. Healing was defined by the presence of bony trabeculae crossing the fracture site. Unweighted Cohen Kappa statistics (κ) were calculated to quantify intra- and interobserver agreement. κ values <0.00 indicate poor agreement, 0.00 to 0.20 slight

agreement, 0.21 to 0.40 fair agreement, 0.41 to 0.60 moderate agreement, 0.61 to 0.80 substantial agreement, and 0.81 to 1.00 almost perfect agreement.[16]

Operative Technique

Following appropriate, typically regional, anesthesia, the operative arm was prepped and draped. A nonsterile tourniquet was used. A small 2 to 2.5-cm dorsal longitudinal incision was made just distal to Lister's tubercle. Dissection was carried down to the dorsal wrist capsule and a longitudinal capsulotomy was performed in-line with the skin incision. The scapholunate interosseous ligament and proximal pole of the scaphoid were identified.

Cancellous autograft bone was obtained by elevating a small oval cortical window along the distal radial metaphysis, just proximal and ulnar to Lister's tubercle. The cortical window was created by using a 0.045-mm Kirshner wire (K-wire) in an oval configuration. The holes were then connected together with a small osteotome. The cortical window was removed and cancellous graft was harvested from the distal radial metaphysis with a curette. DBX (DePuy Synthes, West Chester, PA) bone graft substitute or similar material was placed in the resultant void and the cortical window is replaced and the overlying periosteum was repaired. The use of bone graft substitute is based on the senior author's preference.

Under fluoroscopic guidance, a K-wire was placed center–center in antegrade fashion along the long axis of the scaphoid. A second derotational K-wire was placed in the scaphoid for additional stability. The scaphoid was then reamed with the cannulated 2.5-mm drill from the Acutrak set using the initial center–center K-wire as a guide. Small amounts of harvested cancellous bone graft were placed with forceps into the proximal scaphoid hole and around the guide wire. A 15-gauge blunt needle was then used to pack the cancellous bone graft into the channel created by the cannulated drill (Monoject; Covidien/Medtronic, Minneapolis, MN; ►**Fig. 2A**, **B**). The channel was then re-drilled and re-packed twice more for a total of three iterations. The channel was reamed a final time, the proximal tail hole was enlarged with a 3.4-mm tail profile drill and a mini-Acutrak screw was then placed antegrade along the center–center guidewire down the scaphoid (►**Fig. 2C**). In the two cases with a proximal pole fracture, a micro-Acutrak screw was used. Intraoperative fluoroscopy was used to confirm adequate placement of the screw. All K-wires were removed, the tourniquet released, and hemostasis obtained. The dorsal wrist capsule was then repaired followed by the extensor retinaculum and skin. A sterile dressing and short-arm thumb spica splint was then applied.

Results

Does Repeated Drilling and Graft Packing Prior to Final Screw Insertion Improve Graft Particle Distribution along the Screw Tract in the Scaphoid Bone?

Representative scaphoid sections of the single (►**Fig. 3a**) and triple-packing groups (►**Fig. 3b**) show more graft particles (shown in red) located around the intramedullary screw. Histological analysis of mid-sagittal sections of cadaveric
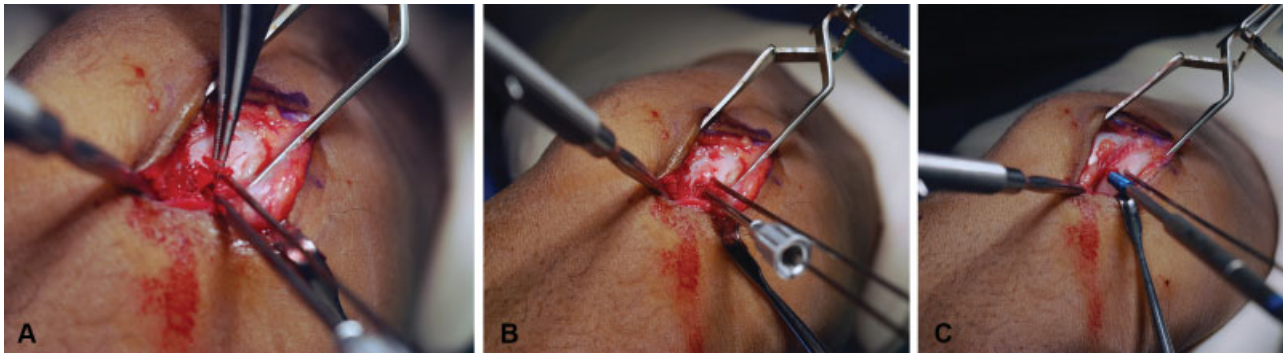
Fig. 2 (A) Dorsal approach to wrist and harvesting of distal radius cancellous autograft (S: scaphoid). (The wrist is oriented in the bottom left corner, fingers in the upper right corner of image.) (B) Triple packing of graft through 15-gauge blunt needle. A second K-wire is observed in the scaphoid to function as a derotational wire. (C) Final placement of a mini-Acutrak screw with the derotational wire still in place.
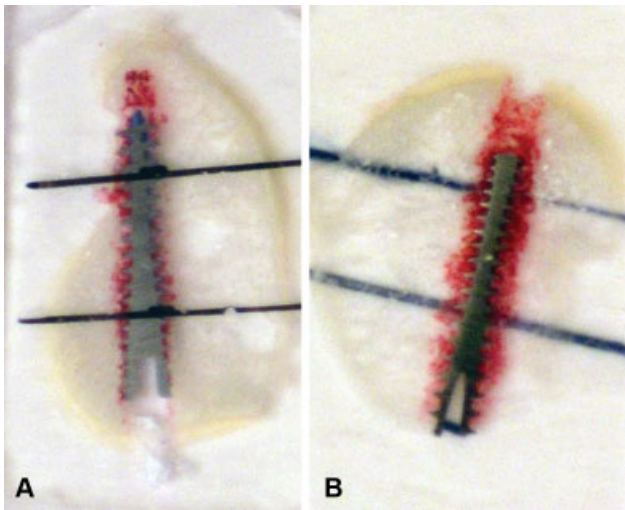

Fig. 3 Representative histological sections of cadaveric scaphoids after (A) single-packing scaphoid section with retained screw and stained autograft or (B) triple-packing scaphoid section with retained screw and stained autograft. Autograft is red and host bone is unstained.

Table 1 Normalized mean area calculations

Group	Subsection	Ag.A/TA	AA.Ag/TA
Single iteration	Distal	0.038 ± 0.022	0.106 ± 0.072
	Waist	0.046 ± 0.030	0.113 ± 0.039
	Proximal	0.029 ± 0.010	0.061 ± 0.024
Triple iteration	Distal	0.038 ± 0.022	0.085 ± 0.052
	Waist	0.069 ± 0.027	0.202 ± 0.052^b
	Proximal	0.050 ± 0.010^a	0.143 ± 0.025^a

Abbreviations: AA.Ag, area available for autograft; Ag.A, autograft area; TA, total area.
[a]$p < 0.05$.
[b]$p < 0.05$ vs. other subsections with triple drill and fill.

scaphoids following ex vivo "drill and fill" demonstrated that there was a significantly greater area of graft particles that accumulated in the proximal pole than the distal pole of the scaphoid when repeating the procedure three times (►**Table 1**, Triple Iteration, Ag.A/TA). The triple iteration also created significantly more area available for graft/TA (space around the screw) in the waist than did the single iteration (►**Table 1**). Within the triple "drill and fill" group, more area available for autograft was created in the waist than the proximal and distal poles. In contrast, the fraction of area available that was filled with autograft (Ag.A/AA.Ag) did not differ significantly between single and triple iteration procedures or among the subsections.

Is Repeated Drilling and Graft Packing a Safe Technique That Results in Radiographic Healing of Scaphoid Delayed Unions and Nonunions?

A total of 12 patients—comprised of one grade I, one grade IIIa, nine grade IV, and one grade IVa nonunions—satisfied inclusion criteria for the clinical portion of this study. Basic demographic and clinical data are presented in ►**Tables 2** and **3**. The mean age for the study cohort was 29 years (range 18–51). Of the 12 patients, two had proximal pole fractures, three had proximal one-third fractures while the remaining seven sustained waist fractures. Both proximal pole fractures had evidence of probable AVN on MRI. Grade IV nonunions were the most common presenting nonunion. Four patients were active smokers at the time of surgery. The mean time from injury to surgery was 30 weeks (standard deviation [SD] = 39.5 weeks), the median time from injury to surgery was 19 weeks and the interquartile range was 16 weeks. The mean time for healing, based on the radiologists first assessment of the radiographs, was 10.2 weeks (SD = 6.1 weeks). The mean length of total follow-up after surgery was 60.4 weeks (SD = 87.5 weeks), with a median of 19.5 weeks and an interquartile range of 45.5 weeks. No postoperative complications were encountered during recorded follow-up. Radiographs of 11 of the 12 patients were determined to be healed as based on the radiographic review by the senior author. Both proximal pole fractures were determined to be healed based on the review by the senior author; neither patient was experiencing pain. κ values indicating inter- and intraobserver agreement of the radiologists are presented in ►**Table 4**. Moderate interobserver agreement between both radiologists was noted for the first reading ($\kappa = 0.43$; −0.27, 1.13 95% CI). There was slight agreement between both radiologists for the second reading ($\kappa = 0.00$; −1.13,

Table 2 Baseline demographics of study population

Characteristic	Total N (Range)
Mean age (in years)	29 (18–51)
Sex	
Male	7
Female	5
Handedness	
Right	11
Left	1
Smoking history	
Active smoker	4
Nonsmoker	8
Mean time from injury to surgery in weeks (SD)	30 (39.5)
Mean time to first read of radiographic healing (SD)	10.2 (6.1)
Mean length of total follow-up in weeks (SD)	60.4 (87.5)

Abbreviation: SD, standard deviation (in units specified by characteristic).

1.13 95% CI). Intraobserver agreement was slight for radiologist A ($\kappa = 0.00$; -1.13, 1.13 95% CI) and almost perfect for radiologist B ($\kappa = 1$; 1, 1 95% CI).

Discussion

Scaphoid nonunions without evidence of proximal pole AVN treated with open techniques (e.g., Fisk-Fernandez and Matti-Russe procedures) have healing rates as high as 90%.[8] Following the success of arthroscopically-assisted percutaneous techniques in the management of acute scaphoid

Table 4 Radiographic assessment of scaphoid nonunion healing following triple "drill and fill" technique

	Radiologist A	Radiologist B	Interobserver κ^a (95% CI)
1st reading	11/12 healed	9/12 healed	0.43 (−0.27, 1.13)
2nd reading	12/12 healed	9/12 healed	0 (−1.13, 1.13)
Intraobserver κ^a (95% CI)	0 (−1.13, 1.13)	1 (1, 1)	

[a]Cohen's unweighted Kappa.

fractures,[9,17] Slade et al expanded the indications for similar techniques via a dorsal approach to include select scaphoid nonunions.[18] His series of 15 patients—limited to fibrous nonunions or nonunions with minimal sclerosis (grade I–III nonunions)—healed at an average of 14 weeks using a headless cannulated compression screw without the use of bone graft. Merrell and Slade further expanded the use of arthroscopically-assisted dorsal percutaneous techniques in grade IV and V nonunions requiring bone grafting to fill the void created by the debridement of devitalized bone.[11,15]

Yassaee and Yang used a similar open technique in his series of nine patients with uncomplicated (no arthritis, AVN, humpback deformity, carpal instability, or pseudarthrosis) nondisplaced scaphoid nonunions.[13] All nine patients healed at an average time of 3 months. Geissler reported union in 14 out of 15 grade IV nonunions using an arthroscopically-assisted percutaneous technique combined with cannulated screw fixation and demineralized bone matrix.[19] Capo et al additionally describe a percutaneous volar technique as another option.[10] Interestingly, Mahmoud and Koptan suggested that bone grafting might not be necessary even in grade IV and V nonunions, as evidenced by their series of 27 patients who all healed with volar percutaneous cannulated

Table 3 Patient demographics and injury characteristics

Patient no.	Age	Sex	Handed	Side involved	Mechanism of injury	Location of fracture	Nonunion grade[a]	Time from injury (wk)	Follow-up (wk)	Outcome
1	35	F	R	R	MCC	Waist	IV	23	13	Healed
2	18	M	R	R	Fall	Prox 1/3	IV	33	49	Healed
3	18	F	R	R	Fall	Prox pole	IIIa	35	21	Healed
4	24	M	R	R	Bicycle	Waist	IV	11	14	Healed
5	35	F	R	L	MVC	Waist	IV	25	17	Healed
6	39	M	L	R	Fall	Waist	IV	20	94	Healed
7	18	F	R	L	ATV	Waist	IV	10	302	Healed
8	48	M	R	L	MVC	Prox pole	IVa	152	153	Healed
9	25	M	L	L	Fall	Prox 1/3	IV	18	20	Healed
10	18	M	R	R	Fall	Waist	IV	11	8	Healed
11	24	M	R	R	MVC	Prox 1/3	IV	16	19	Not healed
12	51	F	R	L	Bicycle	Waist	I	6	15	Healed

Abbreviations: IV, intravenous; MCC, motorcycle collision; MVC, motor vehicle collision.
[a]According to Slade and Dodds.[15]

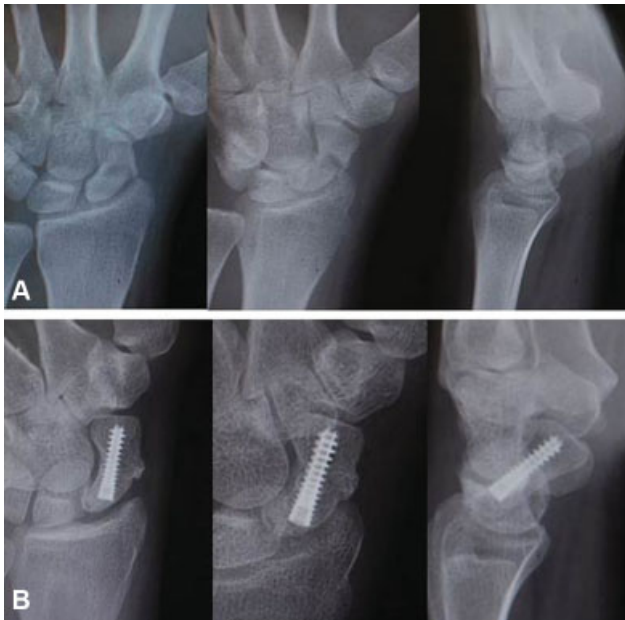**Fig. 4** (**A**) Preoperative radiographs of an 18-year-old woman with a displaced 9-week-old left scaphoid waist fracture sustained in an all-terrain vehicle accident that was initially treated nonoperatively. Computed-tomography scan showed mild displacement in addition to some cystic formation within the waist region consistent with a grade IV nonunion. She subsequently underwent open reduction and internal fixation with cancellous distal radius autograft using the "drill and fill" technique. (**B**) Two-month postoperative radiographs of the same patient show a healed scaphoid nonunion.

screw fixation alone.[20] With a mean follow-up of 24.6 months, they reported fracture union at a mean of 11.6 weeks as confirmed by CT scan.

To our knowledge, no studies have examined the effect of repeated drilling and autograft packing on autograft distribution within the scaphoid. Previous investigators[11,13] have pointed to the risk of breaching the cortical wall as motivation behind performing a second drilling after initial autograft packing along the screw tract. Additionally, prior work has restricted the use of percutaneous and similar mini-open techniques to nondisplaced scaphoid nonunions. Our series is largely composed of nondisplaced scaphoid nonunions, but also includes one displaced nonunion (►**Fig. 4A**, **B**) which did achieve union.

With this "drill and fill" technique, cadaveric analysis revealed that three iterations of autograft packing and drilling resulted in greater accumulation of autograft and area available for autograft in the proximal pole and waist, respectively, compared with a single iteration (►**Table 1**). Repeated packing increases the volume of autograft implanted in the proximal pole in spite of the repeated drilling.

In the waist, we observed a significantly increased area available for autograft (AA.Ag and AA.Ag/TA; ►**Table 1**) with repeated iterations. However, there was not a significant increase in the amount of autograft whether normalized to total area (Ag.A/TA) or to the tract area Ag.A/AA.Ag).

These results suggest that the benefit of repeated drilling and autograft packing may be limited to the proximal pole of the scaphoid. This is perhaps explained by the fact that a
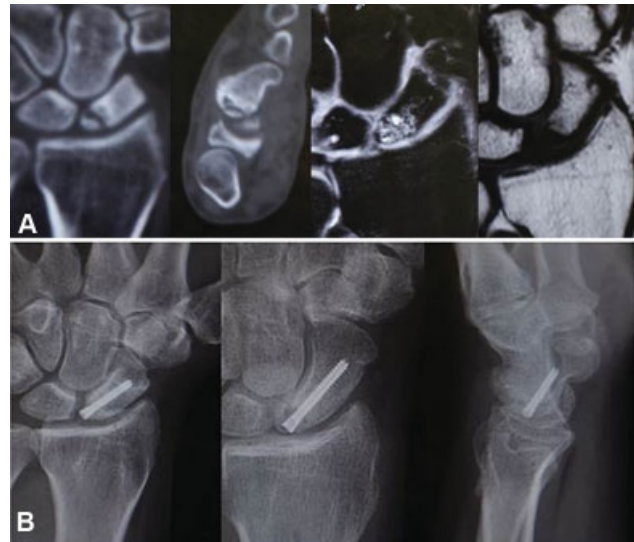

Fig. 5 (**A**) Preoperative computed tomography and magnetic resonance imaging of a 48-year-old man with a 2.5-year-old proximal pole scaphoid nonunion and avascular necrosis. (**B**) One year postoperative radiographs of the same patient show union of the proximal pole. Patient remained asymptomatic through 153 weeks of postoperative follow-up.

dorsal approach dictates that drilling and autograft packing are all initiated proximally, and that any benefit from repeated iterations in the waist or distal pole is mitigated as the process is advanced antegrade down the center of the scaphoid. However, it is possible that more autograft could be distributed in the waist of a scaphoid with a nonunion since the nonunion void would create an additional void of trabecular bone for the autograft to occupy.

Regarding the safety and efficacy of repeated drilling and graft packing leading to radiographic union, the "drill and fill" technique was used in 12 patients, with 11 of 12 going on to achieve clinical union based on radiographic assessment by the senior author. No postoperative complications were reported within the study period. One of the patients with a proximal pole fracture was a 48-year-old male who presented 2.5 years after a wrist injury sustained in a motor-vehicle accident. Imaging demonstrated a grade IV proximal pole scaphoid nonunion with AVN (►**Fig. 5A**). After discussion with the patient regarding vascularized versus nonvascularized bone grafting options, it was decided to attempt the latter using the "drill and fill" technique. At 1-year postoperative follow-up, the patient had no pain and radiographs demonstrated healing as assessed by the senior author (►**Fig. 5B**). This patient did not develop any pain during his postoperative follow-up time of 153 weeks. The promising self-reported outcome and radiographic evidence of union suggests that the "drill and fill" technique can be utilized successfully for proximal pole fractures.

The one persistent nonunion in this series was a 24-year-old male who presented 2 months after a wrist injury sustained in a motor vehicle collision, although he did report a previous wrist injury from a wrestling incident 4 years prior. Imaging demonstrated a proximal one-third fracture with grade IV malunion and probable AVN of the proximal pole (►**Fig. 6A–C**). He had persistent nonunion throughout
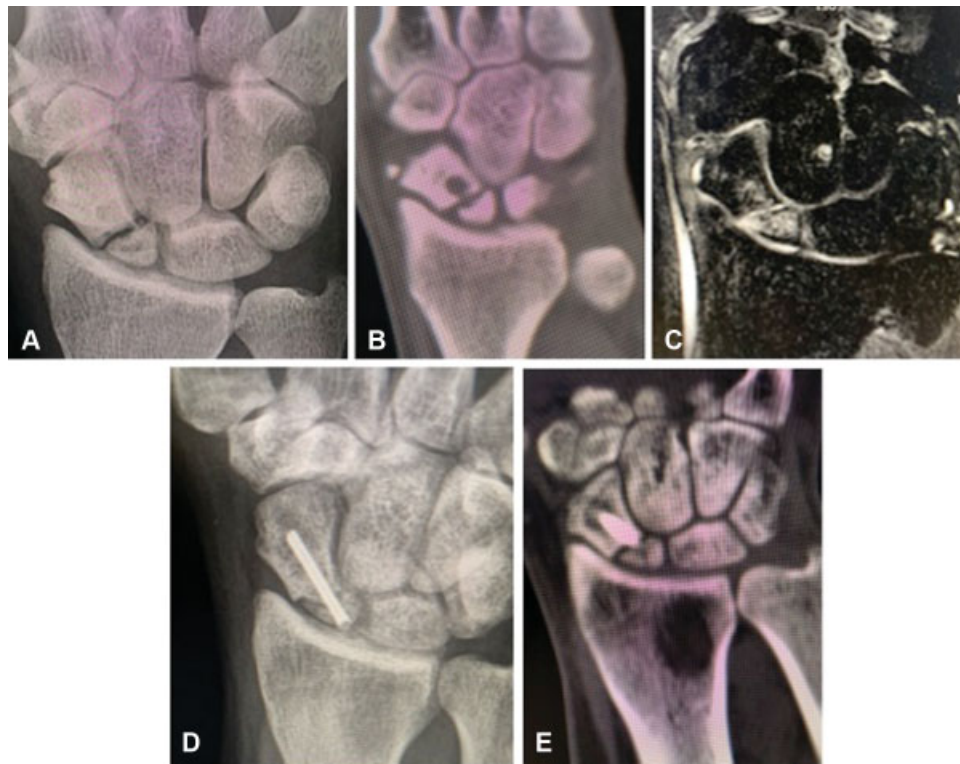
Fig. 6 (**A**) PA preoperative radiographs showing proximal third scaphoid nonunion. (**B**) Preoperative CT scan of scaphoid nonunion showing cyst formation. (**C**) Preoperative MRI scan of scaphoid showing avascularity of proximal pole of the scaphoid. Four month postoperative radiograph (**D**) and CT scan (**E**) of scaphoid showing incomplete healing of the proximal third scaphoid nonunion. CT, computed tomography; MRI, magnetic resonance imaging.

his 4 months of postoperative follow-up (►**Fig. 6D**, **E**). The persistent nonunion observed radiographically suggests that the "drill and fill" technique may need to be limited to cases without evidence of AVN, although as noted above, both proximal pole fractures also demonstrated AVN and healed successfully.

Limitations of this study include the small patient and cadaveric specimen sample sizes, as well as reporting on a single-surgeon experience. We also did not control for several factors that may have influenced autograft distribution in the cadaveric analyses, including specimen bone density, absolute volume and packing pressure of autograft impacted, and magnitude and variability of the pressure applied to the drill bit when drilling. These factors were also not blinded for in the final iteration. Our calculations were also based on two-dimensional metrics (area) from single histologic sections as opposed to volume calculations, which would have better represented autograft distribution within the entire scaphoid. Additionally, we did not control for several covariates known to influence healing rates in the clinical portion of this study, including age of nonunion, amount of bone resorption at the nonunion site, duration of postoperative immobilization, occupation, presence of AVN, and location of the nonunion.[8,21]

Conclusion

This series supports the use of three iterations of the "drill and fill" technique as an option for the treatment of select nondisplaced or minimally displaced scaphoid nonunions and delayed unions at the waist without AVN of the proximal pole. The technique appears to be safe, adding minimal clinical morbidity. Three repetitions of drilling and filling improve cancellous graft distribution along the scaphoid interosseous screw. Healing was noted in 11 of 12 scaphoid delayed unions and nonunions.

Conflict of Interest
None declared.

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